

REMARKS

I. STATUS OF THE CLAIMS

Claims 1-36 are pending in the present application. Claims 1-29 and 31-36 are rejected. Claim 30 is objected to. Applicants thank the Examiner for indicating that claim 30 would be allowable if rewritten in independent form.

By this amendment, claims 1, 3, 6, 13, 19, 24, 30, 31 are amended. Claim 30 is amended to be written in independent form and to correct a typographical error. Claims 2, 4, and 29 are canceled. No new matter is presented by this amendment.

II. INFORMATION DISCLOSURE STATEMENT

According to the Office Action mailed July 23, 2004, the following references contained in the Information Disclosure Statement filed on November 3, 2003 were not considered because the references were not submitted in English and no relevance was stated: JP 10-122541 (05/1998); JP 9-290234 (11/1997); DE 8601942 (02/1988); JP 9-290234 (04/1996); JP 10-122541 (10/1996); and WO 01/33140 (05/2001). Submitted herewith is an information disclosure statement accompanied by English language Abstracts of the references listed therein. No English language version of DE 8601942 (02/1988) was available. It is respectfully requested that the Examiner review the references and acknowledge that each reference listed on the IDS has been considered.

III. OBJECTIONS

A. Drawings

The drawings are objected to under 37 CFR 1.83(a) for not showing all elements of the claims. In particular, the Office Action states that "the second circulating fluid bed combustor, refluxing, diverting a third portion of the fly ash to the third combustion unit occurs before completion of combusting the second portion of the fly ash in the second combustion unit must be shown or the feature(s) canceled from the claim(s)".

It is respectfully submitted that “the second circulating fluid bed combustor” is shown in the drawings. In particular, Fig. 4 depicts a second combustion unit 152, which generally comprises a batch loaded circulating fluid bed combustor (page 9, lines 16-17). Thus, it is respectfully requested that this objection be withdrawn.

As regards use of the term “refluxing”, claim 24 is amended hereby to recite “conveying at least a portion of the combusted fly ash through the fluidized bed”. Support for this amendment is found on page 19, lines 7-15 of the specification. No new matter is presented. The step of conveying at least a portion of the combusted fly ash through the fluidized bed is depicted in Figures 1-3. As such, it is respectfully submitted that this rejection is obviated.

With respect to “diverting a third portion of the fly ash to the third combustion unit occurs before completion of combusting the second portion of the fly ash in the second combustion unit”, claim 30 is amended to recite “diverting a third portion of the fly ash to the first combustion unit..”. New Figure 5 is submitted herewith in accordance with 37 CFR 2.84(c). Corresponding text in the specification is also submitted. No new matter is presented. Figure 5 and its corresponding text describe a method wherein “diverting a third portion of the fly ash to the first combustion unit occurs before completion of combusting the second portion of the fly ash in the second combustion unit” as recited in amended claim 30. Thus, it is respectfully requested that this rejection be withdrawn.

B. Specification

The disclosure is objected to for referring to elements 110, 111, and 112, which are not illustrated on the drawings. The specification is amended hereby to refer to elements 151, 152, and 153, respectively. As such, it is submitted that this rejection is now obviated.

The disclosure also is objected to for referring to Figure 5, which is not in the disclosure. The specification is amended hereby to refer to Figure 1. As such, it is submitted that this rejection is now obviated.

The disclosure further is objected to for referring to an injection line 106, which is not illustrated in the drawings. The specification is amended hereby to refer to an injection line 108. As such, it is submitted that this rejection is now obviated.

C. Claims

Claim 19 is objected to for referring to two combustion units. Claim 19 is amended hereby. As such, it is respectfully submitted that this objection is obviated and should be withdrawn.

III. CLAIM REJECTIONS UNDER 35 U.S.C. §102

A. Rejection under 35 U.S.C. §102(b) over *Borowy*

Claims 31-35 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Pat. No. 5,024,169 to Borowy ("*Borowy*"). In view of the amendments to claim 31 and its associated dependent claims 32-35, reconsideration is respectfully requested.

According to the Office Action, "Borowy shows diverting a first batch of fly ash to a first processing unit (17 under 18, fig. 1), processing the first batch of fly ash in the first processing unit (21, fig. 1); diverting a second batch of fly ash to a second processing unit (17 to left of 18, fig. 1); [and] processing the second batch of fly ash in the second processing unit (31, fig. 1)" (Office Action, page 4). Thus, according to the Office Action, element 18 is a "diverter", and elements 21 and 31 are a first and second "processing unit", respectively. Applicants respectfully disagree with this assessment.

Borowy is directed to a process whereby the fly ash removed from exhaust gases of devices burning organic fuel is separated into usable components for recycling, and waste components for fuel (col. 1, lines 8-11). The ash is subjected to a first cut size classification by a cyclone, screen, or other type or separator. A second classification separates, by density, similar sized particles (col. 2, lines 14-19). After classification, the particles can go to storage, to a boiler, or to additional classification stages (FIG. 1). According to *Borowy*, "[t]he particulate matter is subjected to a first cut size separation at a first separator 18" (col. 3, lines 32-33). "The fine, carbon lean particles are collected in hopper 31..." (col. 3, lines 41-42). "The coarse, carbon rich particles can be collected in hopper 21..." (col. 3, lines 50-51). Thus, the mechanical separator 18 processes the inlet stream 17 (left of 18), and directs the fine particles to hopper 31 and the coarse particles to hopper 21.

Amended claim 31 of the present application is directed to a method of reducing the carbon content of fly ash comprising diverting a first batch of fly ash to a first processing unit, processing the first batch of fly ash in the first processing unit, diverting a second batch of fly ash to a second processing unit, processing the second batch of fly ash in the second processing unit and, collecting the first and second processed batches of fly ash, wherein the first processing unit and the second processing unit independently include at least a combustion unit. Thus, the method of the present invention directs the flow of fly ash to a particular processing unit. The individual components of the fly ash are not separated or otherwise modified. Further, amended claim 31 provides that each of the first and second processing units include at least a combustion unit. In contrast, *Borowy* directs the stream to hoppers 21 and 31, which do not each include a combustion unit.

Given that *Borowy* does not teach or suggest diverting a first batch of fly ash to a first processing unit, diverting a second batch of fly ash to a second processing unit, wherein the first processing unit and the second processing unit independently include at least a combustion unit, *Borowy* is not sufficient to support a rejection of amended claim 31 and its associated dependent claims 31-35 under 35 U.S.C. §102(a). It is therefore submitted that this rejection should be withdrawn.

B. Rejection under 35 U.S.C. §102(b) over *Kawashima*

Claims 1-5, 6-10, 12, 13, 14, 16, 17, 19, and 20-26 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by JP358085011 to Kawashima ("*Kawashima*"). In view of the amendments to claims 1, 13, and 19 and their associated dependent claims 2-12, 14-28, and 20-26 respectively, it is respectfully submitted that this rejection is obviated and should be withdrawn.

Kawashima is directed to a method and apparatus for modifying fly ash within the discharge gas of a fine-powder coal boiler. As depicted in FIG. 2, *Kawashima* includes vertical furnaces arranged in series such that the output of the first furnace is the input to the second furnace. The output of the second furnace passes to a cyclone separator, then to a cooling apparatus.

1. Claims 1-12

Amended claim 1 is directed to a system for treating fly ash comprising a fly ash feed line, a diverter in flow communication with the feed line, the diverter including a first outlet in flow communication with a first combustion unit, and a second outlet in flow communication with a second combustion unit, and a collection vessel in flow communication with the first combustion unit and the second combustion unit.

Kawashima does not teach or suggest a diverter in flow communication with the feed line, the diverter including a first outlet in flow communication with a first combustion unit, and a second outlet in flow communication with a second combustion unit. Instead, *Kawashima* teaches a diverter that directs a flow to a first air current furnace, where the outlet of the first air current furnace is the inlet of a second air current furnace. Given that *Kawashima* does not teach or suggest all elements of Applicant's invention as claimed in claim 1 and its associated dependent claims 2-12, *Kawashima* is insufficient to support a rejection under 35 U.S.C. §102(a). It is therefore submitted that this rejection is obviated and should be withdrawn.

2. Claims 13-18

Claim 13 is directed to a system for reducing the concentration of carbon in fly ash comprising a feed vessel having an inlet in flow communication with a fly ash supply, a diverter in flow communication with an outlet of the feed vessel, a first combustion unit in flow communication with a first outlet of the diverter, and a second combustion unit in flow communication with a second outlet of the diverter.

Kawashima does not teach or suggest Applicant's invention as recited in claim 13. Specifically, *Kawashima* does not teach or suggest a diverter in flow communication with an outlet of the feed vessel, a first combustion unit in flow communication with a first outlet of the diverter, and a second combustion unit in flow communication with a second outlet of the diverter. Instead, *Kawashima* teaches a feed source connected to a first furnace, the output of which is fed into a second furnace. Given that *Kawashima* does not teach or suggest all elements of Applicant's invention as claimed in claim 13, *Kawashima* is not sufficient to

support a rejection of claim 13 and its associated dependent claims 14-18. As such, it is submitted that this rejection is obviated and should be withdrawn.

3. Claims 19-26

Amended claim 19 is directed to A method of processing fly ash comprising feeding fly ash to a diverter, diverting a first portion of the fly ash from the diverter to a first combustion unit, diverting a second portion of the fly ash from the diverter to a second combustion unit, combusting the first portion of fly ash in the first combustion unit, thereby reducing the carbon content of the first portion of fly ash, and combusting the second portion of the fly ash in the second combustion unit, thereby reducing the carbon content of the second portion of fly ash.

Kawashima does not teach or suggest diverting a first portion of the fly ash from the diverter to a first combustion unit, diverting a second portion of the fly ash from the diverter to a second combustion unit. Instead, *Kawashima* teaches supplying fly ash to a first furnace, and directing the output of the first furnace to a second furnace. Given that *Kawashima* does not teach or suggest all elements of Applicant's invention as claimed in claim 19 and its associated dependent claims 20-26, *Kawashima* is insufficient to support a rejection under 35 U.S.C. §102(a). It is therefore submitted that this rejection is obviated and should be withdrawn.

C. Rejection under 35 U.S.C. §102(e) over *Bachik*

Claims 1-3 are rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Pat. No. 6,202,573 to Bachik ("*Bachik*"). In view of the amendments to claim 1 and its associated dependent claims 2-3, it is respectfully submitted that this rejection is obviated and should be withdrawn.

Bachik is directed to an apparatus for the removal of carbon fly ash. The apparatus includes a vessel having an ignition chamber and a burnout chamber. A bed of fly ash is moved through the ignition chamber and the burnout chamber. According to *Bachik*, this configuration "allows, after carbon ignition, the majority of carbon burnout to occur in a separate environment that involves relatively lower levels of temperature and oxygen in the oxidizing gas stream for continued carbon burnout" (col. 3, lines 39-43).

As stated above, amended claim 1 is directed to a system for treating fly ash comprising a fly ash feed line, a diverter in flow communication with the feed line, the diverter including a first outlet in flow communication with a first combustion unit, and a second outlet in flow communication with a second combustion unit, and a collection vessel in flow communication with the first combustion unit and the second combustion unit.

Bachik does not teach or suggest a diverter in flow communication with the feed line, the diverter including a first outlet in flow communication with a first combustion unit, and a second outlet in flow communication with a second combustion unit. Instead, *Bachik* requires the processing chambers to be arranged in series to “accomplish economical processing” (col. 3, lines 43-45).

Given that *Bachik* does not teach or suggest all elements of Applicant’s invention as claimed in claim 1 and its associated dependent claims 2-3, *Bachik* is not sufficient to support a rejection under 35 U.S.C. §102(e). It is therefore submitted that this rejection is obviated and should be withdrawn.

IV. CLAIM REJECTIONS UNDER 35 U.S.C. § 103(a)

In the Office Action, claims 1, 5-11, 15, 18, and 27-29 were rejected over various combinations of U.S. Pat. No. 5,425,317 to Schaub; U.S. Pat. No. 5,731,564 to Kujawa; U.S. Pat. No. 6,202,573 to *Bachik*; U.S. Pat. No. 6,338,306 to Perrone; JP JP358085011 to *Kawashima*; and U.S. Pat. No. 3,877,397 to *Davies*. Claim 29 is canceled hereby. In view of the amendments to claims 1, 13, and 19, it is respectfully submitted that the rejection of claims 1, 5-11, 15, 18, 27, and 28 is obviated.

With respect to the rejection of claims 1 and 5-11, none of the cited references teach or suggest a system for treating fly ash comprising a fly ash feed line, a diverter in flow communication with the feed line, the diverter including a first outlet in flow communication with a first combustion unit, and a second outlet in flow communication with a second combustion unit, and a collection vessel in flow communication with the first combustion unit and the second combustion unit.

With respect to the rejection of claims 15 and 18, none of the cited references teach or suggest a diverter in flow communication with an outlet of the feed vessel, a first combustion unit in flow communication with a first outlet of the diverter, and a second combustion unit in flow communication with a second outlet of the diverter.

With respect to the rejection of claims 27-29, none of the cited references teach or suggest a method of processing fly ash comprising feeding fly ash to a diverter, diverting a first portion of the fly ash from the diverter to a first combustion unit, diverting a second portion of the fly ash from the diverter to a second combustion unit, combusting the first portion of fly ash in the first combustion unit, thereby reducing the carbon content of the first portion of fly ash, and combusting the second portion of the fly ash in the second combustion unit, thereby reducing the carbon content of the second portion of fly ash.

Since none of the cited references teach each element of Applicant's claimed invention, the various combinations of the references are not sufficient to support a rejection of the claims under 35 U.S.C. §103(a). As such, it is respectfully requested that the rejection of claims 1, 5-11, 15, 18, and 27-29 under 35 U.S.C. §103(a) be withdrawn.

V. ALLOWABLE SUBJECT MATTER

Claim 30 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. Claim 30 is rewritten hereby in independent form and to correct a typographical error. As such, it is believed that claim 30 is now in condition in for allowance.

Title: Method and Apparatus for Combustion of Residual Carbon in Fly Ash
Serial No.: 10/686,149
Filed: October 15, 2003

CONCLUSION

In view of the foregoing remarks, Applicants respectfully assert that the rejection of the claims as set forth in the Office Action of July 23, 2004 have been addressed and overcome. Applicants further respectfully assert that all claims are in condition for allowance and request that a Notice of Allowance be issued. If issues may be resolved through Examiner's Amendment, or clarified in any manner, a call to the undersigned at (404) 879-2437 is courteously solicited.

Respectfully submitted,



Dana E. Stano
Reg. No. 50,750

Date: January 12, 2004
Womble Carlyle Sandridge & Rice, PLLC
P.O. Box 7037
Atlanta, GA 30357-0037
(404) 879-2433 (direct)
(404) 879-2433 (facsimile)

Our Docket No.: C152 1131.1

AMENDMENTS TO THE DRAWINGS

The attached drawing sheet includes new Figure 5. Figure 5 is a schematic illustration of another exemplary combustor system according to the present invention.